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The Electrical Experimenter

POPULAR ELECTRICAL NEWS ILLUSTRATED

FIRING ELECTRIC BOMBS

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LARGEST CIRCULATION OF ANY ELECTRICAL PUBLICATION

New Electro-Therapeutic Apparatus

By H. ROSENTHAL

X-Ray

AT the convention of the American Medical Association held at the Hotel Astor in June at New York City, the exhibit of electric apparatus showed many interesting new developments, particularly those to be used in connection with hospitals and field hospitals at the front.

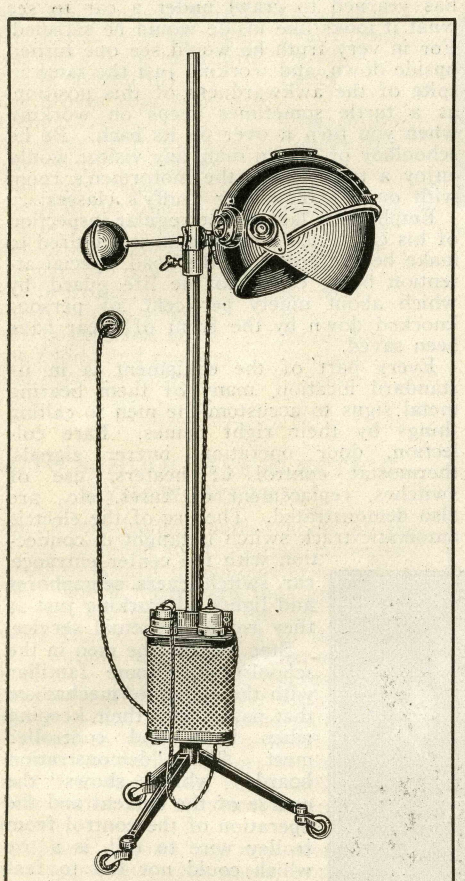


Fig. 4. A New Quartz Mercury Arc Lamp For Treating Skin Diseases.

One very ingenious X-ray equipment consisted of a portable table for laying the patient upon to be X-rayed; the outfit also included a small gasoline engine generating set, a closed core transformer, this transformer being used in connection with a regulating device to operate a new type of X-ray tube. This tube, about four inches in diameter (see illustration, Fig. 1), had an *anode* terminal of solid tungsten metal supported on a rod of molybdenum and a *cathode* consisting of a tungsten spiral, which was heated electrically from a low voltage circuit from the primary of the transformer. The X-ray tube suppresses any current in the direction that does not make the hot filament cathode. It therefore is capable of rectifying its own current. In order to make the conditions stable a large set of air cooled ventilating vanes are made part of the anode of the tube.

The gasoline engine unit which operates the transformer is so designed with an electrically controlled solenoid that it can be placed some distance from a base hospital or tent, thus eliminating the unpleasant noise. The entire equipment is so arranged as to be portable for immediate transportation.

X-Ray Accessories

Some of the newer developments in the accessories to be used in connection with X-ray work include the Hydrex tube, Fig. 2. This tube operates on the principle of having an auxiliary chamber filled with hydrogen and sealed from the top by a mechanically operated mercury valve. This valve is opened by drawing the mercury past two porous blocks, thereby leaving a passage for a certain amount of hydrogen to enter the tube. To open the valve a small suction pump is provided and is clamped directly on to the glass bowl, or any other convenient place, so the rubber tube can be attached to the hydrogen chamber. To lower the vacuum the plunger is pulled out to its full length and released immediately. To raise the vacuum all that is necessary is to disconnect the anode and connect it to cathode and run a weak current thru the tube.

Very elaborate tables of new development were shown for laying the patient upon and so equipt as to be used either for examination with a fluoroscope or to be used directly in taking X-ray plates.

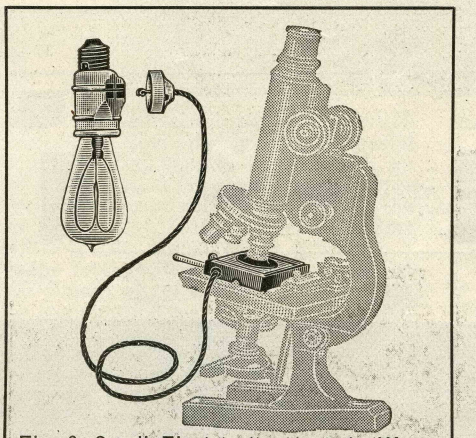


Fig. 6. Small Electrically Heated "Warm Stage" for the Microscope.

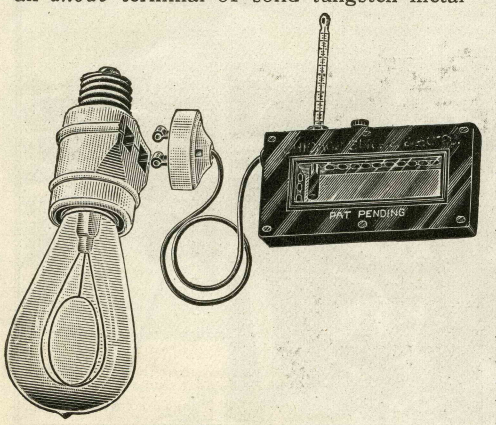


Fig. 7. This Miniature Electric Incubator for Microscope Stages Enables the Physician to Study "Live" Bacteria Organisms.

One type of table was so nicely counterbalanced that very little effort was needed to obtain almost any position an operator would wish. It was also arranged with a small motor, foot controlled, which would raise the table or lower it in an angular position, according to the will of the operator.

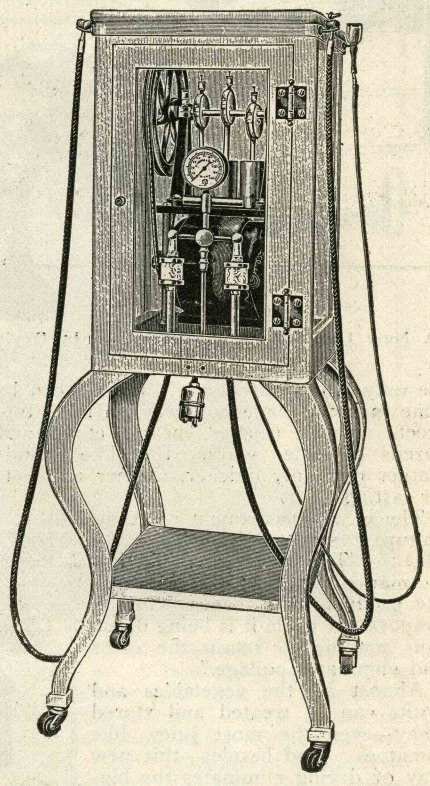
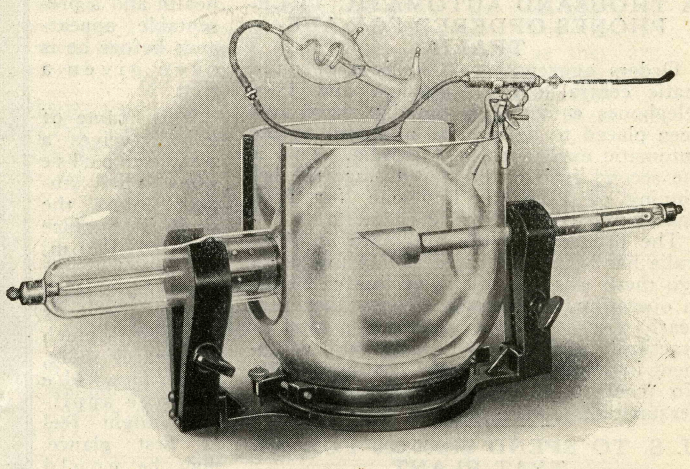


Fig. 5. A Recent Type of Anesthetizing Apparatus, Driven by a Small Electric Motor.

Another type of table was fitted with accessories necessary for making charts of the heart and lungs, these charts or tracings being made directly by examining the patient with a fluoroscope and by means of an automatic device.

A duplicate of the X-ray equipment supplied to the N. Y. Bellevue Hospital was also shown, being the largest X-ray plant in the United States.

(*Continued on page* 421)



Hydrogen Thru a Mercury Valve. Vacuum Is Adjustable.
Hydrogen Thru a Mercury Valve Vacuum Is Adjustable.

NEW ELECTRO-THERAPEUTIC APPARATUS.

(*Continued from page* 373)

Sinusoidal Machines

One of the most radical new developments in electrical therapeutics was shown in the form of a Morse Sinusoidal Wave Generator. The machine delivers a current of 21,000 alternations or 42,000 impulses per minute and is designed on what is known as the Kennelly design, the principle being a circular layer of spools composed of two separate coils, an inner one with eight layers of fine wire, and an outer one of two layers of coarse wire, the inner coil being connected in a series and constituting a *secondary* coil, while the outer coil, also connected in a series, forms the *primary* coil of the apparatus. A direct current is supplied to the primary coil and to the armature, which is composed of laminated iron. When the armature is made to revolve the primary coils, having a current circulating thru them, magnetizes the field magnets. The magnetic lines of force thus produced remain stationary in the field as long as the armature is stationary, but as soon as the armature rotates the lines of force shift from one side of the magnetic field to the other and cut the current in the wires of the secondary coil, first one side and then the other, which produces a Sinusoidal current in the secondary coil.

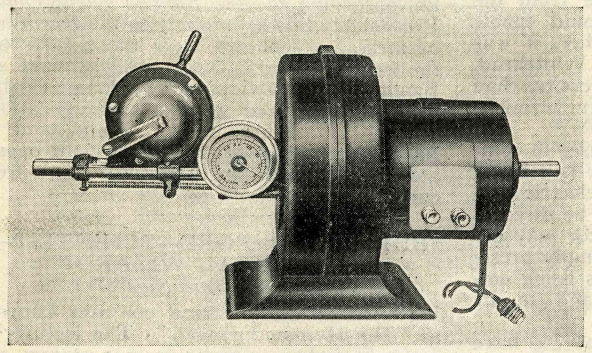


Fig. 3. The Latest Pattern Sinusoidal Generator Which Yields Currents of Any Desired Wave Form. Special Cams as Shown Below, Control This Factor and Can be Interchanged Instantly.

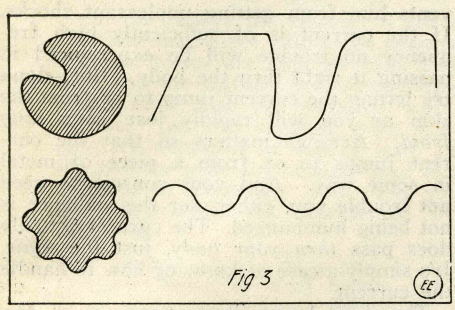


Fig 3

In the apparatus shown, Fig. 3, the primary coil and secondary coil are conical in shape, one moving within the other, this being done by a set of cams, the shape of the cam regulating the type of wave which will be sent into the patient's circuit, and a separate rheostat controls the strength of this current.

Light Therapy

For the treatment of skin diseases a quartz mercury arc lamp was shown which gave off very powerful radiations, the radiations being so intense that the darkest kind of tinted glasses were loaned to the observer before he was allowed to look at the light. From a lamp of this kind a typical case of *sunburn* could be produced in a few minutes time. (See Fig. 4.)

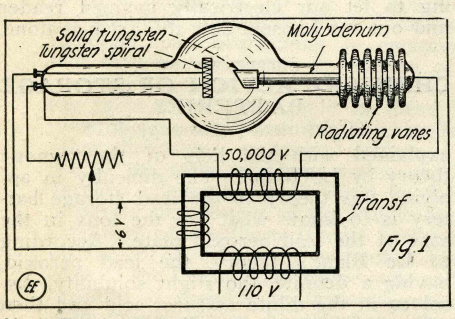
Miscellaneous

A valuable Anesthetizing Outfit was shown (see Fig. 5), operated by a small electric motor of special design for use in operations of the month and head.

An interesting Recording Instrument was shown for obtaining the temperature within the stomach known as *introgastric temperature,* valuable in checking up the gastric response to stimulus, showing the action of different foods, both hot and cold, practically in degrees upon the scale of the instrument.

For the man with a microscope there were several new devices, such as a special light for illuminating the stage of a microscope, and one exhibit showed an electrically heated warm stage for the microscope for use in examining different bacteria and micro-organisms which only remain alive in warm temperatures (blood heat).

An Electric Incubator for use in connection with a microscope was exhibited, which can also be used in connection with the development of special animal organisms and bacteria so that they can be cultivated directly under the microscope.



New Form of X-Ray Tube Which Rectifies Its Own Current, on the Principle of the Hot Cathode. Air Cooling Vanes Are Placed on the Anode.

THE EFFECT OF ULTRA-VIOLET RAYS ON MILK AND OTHER ASPECTS.

(*Continued from page* 383)

it for the protection of their soldiers and horses campaigning at this time in the colonies of Toncken, Asia, and as it had protected the head against the violent action of the ultra violet rays it was quite successful.

At this time England also tried this protection against the ultra violet rays and as an experiment, an under officer of the English army was completely clothed in garments which had been previously treated to withstand the ultra violet rays. It was found that he was able to stay in the sun of midsummer for hours, without feeling any disturbance or inconvenience in any way. Upon this and other experiments the English Government adopted this method for the protection of their Indian troops against the ravages of tropical sunlight.

INCREASE WIRELESS GUARD AT SAYVILLE.

Fifteen United States Marines have been added to the detail which has been guarding the wireless station at Sayville. There are now sixty-five men from the Marine Corps at the station and it is said that about twenty-five more will arrive shortly to augment the force. Ensign W. R. Smith, U. S. N. R., is in command.

The entire acreage belonging to the Atlantic Communication Company, which is in charge of the plant, is being cleaned up. Much of its area was wooded and afforded cover.